

Clean Set of Amended Claims

1. (Amended) An apparatus for controlling cooling of a gantry having at least one linear motor comprising:
- at least one stator comprising a first temperature sensor, a heat sink and a cooling fan at predetermined portions of the at least one stator;
- at least one mover comprising a second temperature sensor, and a heat sink installed on the upper surface of the at least one mover;
- an encoder configured for sensing at least one of a position and velocity of the at least one mover;
- an encoder periphery sensor attached proximate to the encoder and configured for measuring at least one of a surrounding temperature, humidity and pressure;
- an A/D converter configured for receiving a first temperature signal and a second temperature signal and converting the first and second temperature signals from analog signals to digital signals and outputting the digital signals;
- at least one mover driver configured to provide a drive signal to a coil block attached to the mover;
- a controller configured for controlling a drive signal outputted from the mover driver to control the velocity of the at least one linear motor; and
- a D/A converter configured for converting at least one of a cooling fan control digital signal to an analog drive signal.

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2. (Amended) The apparatus of claim 1, wherein the encoder comprises an indication member for indicating position information of the at least one mover and an optical sensor for reading the position information.

3. (Amended) The apparatus of claim 1, wherein the at least one mover further comprises a nozzle connected to an air valve and configured to cool the at least one mover, wherein the D/A converter is further configured to receive an air valve control digital signal and produce an analog drive signal to control the air valve.

4. (Amended) A method for controlling cooling of a gantry having at least one linear motor, comprising :

operating at least one mover and at least one stator of the at least one linear motor;

measuring temperatures of the at least one mover and the at least one stator;

storing the measured temperatures;

comparing the measured temperatures with a pre-set temperature value;

computing a difference between the pre-set temperature value and the measured temperatures if the measured temperatures are greater than the pre-set temperature value;

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computing a temperature gain corresponding to the computed temperature difference; and

driving at least one of a cooling fan and an air valve as long as the temperature gain is greater than a pre-set gain value.

5. (Amended) A method for controlling cooling of a gantry comprising at least one linear motor having a stator and a mover, comprising:

operating the mover in accordance with a movement command;
measuring at least one of a position and a velocity of the mover with an encoder;
making a first measurement of at least one of environmental temperature,
humidity and pressure;

determining first temperature values of the stator and the mover;
storing the first temperature values;
comparing the first temperature values with a pre-set value;
computing a temperature difference between the first temperature values and the pre-set value in the case that at least one of the first temperature values is greater than the pre-set value;

computing a temperature gain from the temperature difference;
driving at least one of a cooling fan and an air valve in accordance with the temperature gain;

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determining second temperature values of the stator and the mover;
storing the second temperature values;
comparing the second temperature values with the pre-set value; and
correcting a movement command if at least one of the second temperature values
is greater than the pre-set value.

6. (Amended) The method of claim 5, wherein if at least one of the second temperature values is less than the pre-set value, then the method returns to measuring at least one of a position and a velocity of the encoder.

B. Please add new claims 7-28 as follows:

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7. (New) A cooling system for a gantry having a linear motor, comprising:
a temperature sensor configured to be attached to the linear motor and produce
a linear motor temperature signal;
a processor configured to receive the linear motor temperature signal and produce
a first control signal in accordance with a difference between a sensed temperature of the linear
motor and a prescribed value; and
a first cooling device configured to cool the linear motor in accordance with the
first control signal.
8. (New) The cooling system of claim 7, wherein the first cooling device comprises
a fan.
9. (New) The cooling system of claim 7, wherein the first cooling device comprises
a nozzle connected to a valve and configured to supply a flow of cooling air to the linear motor.
10. (New) The cooling system of claim 7, further comprising a second cooling device
configured to cool the linear motor in accordance with a second control signal from the
processor, wherein the first cooling device and the second cooling device are different types of
devices.

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11. (New) The cooling system of claim 7, wherein the temperature sensor comprises multiple temperature sensors that are positioned on different portions of the linear motor.

12. (New) The cooling system of claim 7, wherein the first cooling device is configured to cool a stator of the liner motor.

13. (New) The cooling system of claim 7, wherein the first cooling device is configured to cool a mover of the linear motor.

14. (New) The cooling system of claim 7, further comprising a linear motor controller configured to control movements of the linear motor in accordance with a second control signal produced by the processor.

15. (New) The cooling system of claim 14, wherein the processor is configured to produce a second control signal that causes the linear motor controller to reduce a speed of a mover of the linear motor when the processor determines that the sensed temperature of the linear motor is above a predetermined temperature.

16. (New) The cooling system of claim 7, further comprising an environment sensor configured to sense at least one of an environmental temperature, pressure or humidity and

produce an environment signal in accordance thereto, wherein the processor is further configured to produce the first control signal based on the environment signal.

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17. (New) A cooling system for a gantry having a linear motor, comprising:

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a temperature sensor configured to be attached to the linear motor and produce a linear motor temperature signal;

a processor configured to receive the linear motor temperature signal and produce a cooling control signal and a driver control signal in accordance with a difference between the linear motor temperature signal and a predetermined value;

a cooling device configured to cool the linear motor in accordance with the cooling control signal; and

a motor driver configured to control movements of the linear motor in accordance with the driver control signal.

18. (New) The cooling system of claim 17, wherein the motor driver varies a velocity of the linear motor in accordance with the driver control signal.

19. (New) The cooling system of claim 17, wherein the temperature sensor comprises:

a stator temperature sensor configured to sense a temperature of a stator of the linear motor and to produce a stator temperature signal; and

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a mover temperature sensor configured to sense a temperature of a mover of the linear motor and to produce a mover temperature signal, wherein the processor is configured to receive both the stator temperature signal and the mover temperature signal, and wherein the processor produces the cooling control signal and the driver control signal in accordance with a difference between the stator temperature signal and a first predetermined value and a difference between the mover temperature sensor and a second predetermined value.

20. (New) The cooling system of claim 19, wherein the first predetermined value is equal to the second predetermined value.

21. (New) The cooling system of claim 19, wherein the cooling device comprises:
a first cooling device configured to cool the stator; and
a second cooling device configured to cool the mover.

22. (New) The cooling system of claim 21, wherein the processor is configured to produce a first cooling control signal and a second cooling control signal, wherein the first cooling device is configured to cool the stator in accordance with the first cooling control signal, and wherein the second cooling device is configured to cool the mover in accordance with the second cooling control signal.

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23. (New) A method of cooling a gantry having a linear motor, comprising:
measuring a temperature of the linear motor;
comparing the temperature of the linear motor with a predetermined value; and
activating a cooling device configured to cool the linear motor if the temperature

of the linear motor is greater than the predetermined value.

24. (New) The method of claim 23, wherein the activating step comprises activating at least one of a fan and a nozzle configured to deliver cooling air to the linear motor.

25. (New) The method of claim 23, further comprising measuring at least one of environmental temperature, pressure and humidity, and wherein the activating step is also performed based on the measured at least one environmental temperature, pressure or humidity.

26. (New) The method of claim 23, wherein the measuring step comprises:

measuring a temperature of a stator of the linear motor; and
measuring a temperature of a mover of the linear motor.

27. (New) The method of claim 26, wherein the activating step comprises:

activating a first cooling device configured to cool the stator of the linear motor if the temperature of the stator is greater than the predetermined value; and

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C/MCLD* activating a second cooling device configured to cool the mover of the linear motor if the temperature of the mover is greater than the predetermined value.

28. (New) The method of claim 23, further comprising reducing an operating speed of the linear motor if the temperature of the linear motor is greater than the predetermined value.
